REMARKS

Claims 32-36, 39-50, 59 and 62-68 are pending in the present application. Applicants are pleased to note that Claim 59 is allowed. The remaining claims stand rejected on a variety of grounds, each of which is addressed below.

Claim 32 is amended herein to indicate that the water soluble hydrolysate can be spray dried. Support for this amendment can be found in Examples 3 and 4 of the specification. Claim 62 is amended herein to indicate that the peptides that are utilized in the method of treatment have been isolated prior to administration. Support for this amendment can be found in Example 15 of the specification. Claim 66 has been amended to recite particular bioactivities, as discussed below. No new matter is added by these amendments.

Claim Rejections Under 35 U.S.C. §112

Claim 66 was rejected under 35 U.S.C. §112, first paragraph, for the recitation of "bio-activity." The Examiner found that the claim language encompasses testing for many bio-activities that are not supported by the disclosure as filed. Applicants submit that the scope of the term "bio-activities" would be clear to one of skill in the art based on the disclosure. Nevertheless, to facilitate prosecution Applicants have amended Claim 66 herein to refer to a bio-activity selected from the group consisting of angiotensin converting enzyme (ACE) inhibiting activity and reduction of in vivo blood pressure. Support for these activities can be found in Examples 15 and 16 of the specification. In view of this amendment, Applicants request withdrawal of the rejection of Claim 66.

Claim Rejections Under 35 U.S.C. §102

Claims 32, 33, 35, 42, 44, 45, 50 and 63 were rejected under 35 U.S.C. §102(b) as anticipated by Mullally et al. (Int. Dairy J. 7:299-303 (1997), hereinafter "Mullally"). The Examiner found that Mullally discloses a process in which whey protein concentrate is contacted with protease at a temperature of 50°C at a pH of 8 to achieve a degree of hydrolysis ranging from 0 to 8%, followed by heat inactivation and testing for ACE inhibiting activity. The Examiner concluded that as a result, Mullally anticipates the claims. Applicants respectfully disagree.

Applicants disclose a process for producing hydrolysates that can be utilized commercially, for example in food products as described in Examples 6-10 of the specification. Mullally, on the other hand, is a scientific publication and is only concerned with preparing a hydrolysate that can be tested for the activity of ACE inhibition. In this regard Applicants process differs from that of Mullaly in that it facilitates further commercial processing of the hydrolysate while the process of Mullally does not. In particular, as Applicants have pointed out previously, there is no teaching or suggestion in Mullally of deactivating the protease under conditions which produce a *water soluble hydrolysate*, as recited in independent Claim 32. The distinction is not, as suggested by the Examiner on page 8 of the Office Action, that the conditions employed by Mullally would modify the activity of any bioactive compounds in the hydrolysate. Rather, the distinction is that the process of Claim 32 produces a *water soluble hydrolysate* while the process described by Mullally would produce an *insoluble* hydrolysate.

Further, Claim 32 has been amended to indicate that the water soluble hydrolysate can be spray dried. In contrast, it would not be possible to process the insoluble hydrolysate of Mullally by spray drying.

Two declarations in support of Applicants' position are submitted herewith for the Examiner's consideration. The Declaration of Sophia Stathopoulos and the Declaration of Julian Robert Reid confirm that the conditions of Mullally produce an insoluble hydrolysate.

In her declaration, Ms. Stathopolous describes performing an experiment in which the inactivation conditions of Mullally were utilized. Neutrase enzyme was used to prepare a hydrolysate from whey protein concentrate according to Example 4 of the present specification. Following hydrolysis, a number of different heat inactivation steps were compared, including inactivation at 88°C for 3 seconds, as described in Example 4, and inactivation at 80°C for 20 minutes as described by Mullally. When subjected to the inactivation conditions disclosed by Mullally, the hydrolysate formed a thick coagulant. Ms. Stathopolous concluded that the use of a heat step of 80°C for 20 minutes to inactivate the enzyme in a WPC hydrolysate, as taught by Mullally, produces "a coagulated product (Figure 1) that is impossible to process further and is therefore of no commercial value." As these inactivation conditions are the only ones taught by Mullally, the reference does not teach deactivating the protease under conditions which produce a water soluble hydrolysate, as claimed.

In his Declaration, Dr. Reid confirms the results of the experiments performed by Ms. Stathopolous. In paragraph 6, Dr. Reid states that although the hydrolysate produced using the inactivation conditions of Mullally may comprise peptides that are soluble and have ACE inhibiting activity, "the undigested protein and the very large protein fractions which have been denatured by the deactivating conditions are also present." The presence of large denatured protein fractions confirms the insolubility of the hydrolysate produced by Mullally.

As the only inactivation conditions disclosed by Mullally produce an insoluble coagulant, Mullally can not teach or suggest a method of producing a *soluble* whey protein hydrolysate that comprises terminating the hydrolysis when a degree of hydrolysis of no greater than 10% has been reached by deactivating said protease *under conditions which produce a water soluble hydrolysate*, as claimed. In addition, one of skill in the art will recognize that a coagulated hydrolysate is not capable of being processed by spray drying. This is confirmed by the Declarations of Ms. Stathopolous and Dr. Reed, which state that a hydrolysate treated with the inactivation conditions of Mullally can not be processed further as a commercial product.

As Mullally does not teach or suggest deactivating a protease under conditions which produce a water soluble hydrolysate that can be spray dried, Applicants submit that the rejection of Claim 32 under 35 U.S.C. §102(b) should be withdrawn. Claims 33, 35, 42, 44, 45, 50 and 63 depend from Claim 32 and include additional distinguishing features. Thus, the rejection of these dependent claims should be withdrawn as well.

Claim Rejections Under 35 U.S.C. §103

Claims 32-36, 39-50 and 62-68 were rejected under 35 U.S.C. §103(a) as unpatentable over Mullally in view of Abubakar et al. (Tohoku Journal of Agricultural Research 47:1-8 (1996); hereinafter "Abubakar") or over Mullally in view of Abubakar and Soehnlen (U.S. Patent No. 4,358,464).

As discussed above, Mullally fails to teach or suggest a method of preparing a soluble hydrolysate comprising inactivating the protease under conditions which produce a water soluble hydrolysate that can be spray dried, as recited in Claim 32. Neither Abubakar nor Soehnlen makes up for this deficiency. As a result, Applicants submit that the rejection of Claim 32 should be withdrawn. As Claims 33-36, 39-50 and 63-68 depend from Claim 32 and comprise

additional distinguishing features, Applicants request withdrawal of the rejection of these claims as well.

Although Applicants believe that Claim 32 and the claims that depend therefrom are allowable for the reasons presented above, it is possible that the Examiner's arguments with respect to Claims 36, 39 and 40 could be considered relevant to Claim 32 as well. Thus, Applicants address these arguments here.

Claims 36, 39 and 40 recite particular hydrolysis terminating conditions. In rejecting these claims, the Examiner states that "the determination of suitable parameters for heat and/or pH based enzyme inactivations [sic] ...for the processes of Mullally and Abubakar would have been obvious in view of the fact that such methods of enzyme inactivation are notoriously well known in the enzyme arts, the determination of suitable or effective paramaters in such processes being routinely optimised by those skilled in the art."

Applicants strongly disagree. First, the Examiner has cited nothing in support of his position that determination of suitable parameters are "notoriously well known" in the art. Further, there is nothing in Mullally or Abubakar that teaches or suggests that determination of suitable parameters needs to be carried out. Mullally discloses conditions for the inactivation of the protease in their process. The conditions that they used produced a hydrolysate that was suitable for their purposes. They do not suggest that different inactivation conditions would be desirable, or that the conditions they provide are not optimal. As a result, there is no motivation to change the inactivation conditions from those that are disclosed.

As discussed briefly above, Mullally was testing for the presence or absence of ACE inhibitory activity. They were able to make this determination in the insoluble hydrolysates that they produced. Thus, their conditions were suitable to achieve their goals and there is no motivation to adjust the conditions. Further, they were not concerned with industrial scale processes for producing hydrolysates with such activity that could be further processed commercially. As a result, there is no recognition of the practical difficulties that their inactivation conditions would cause in an industrial process and there is no motivation to explore other inactivation conditions. More particularly, there is no motivation to provide inactivation conditions that would produce a water soluble hydrolysate that can be spray dried.

Independent Claim 62 was also rejected under 35 U.S.C. §103 as obvious over Mullally in view of Abubakar. Claim 62 has been amended herein to recite the use peptides that have been isolated in the method of reducing systolic blood pressure. As the isolated peptides of Claim 59 have been found to be allowable, Applicants submit that the method of utilizing the isolated peptides recited in Claim 62 is allowable as well. Thus, the rejection of Claim 62 should be withdrawn.

Conclusion

In view of the arguments and amendments presented above, Applicants submit that the present application is in condition for allowance. If any issues remain, the Examiner is cordially invited to contact Applicants' representative at the number provided below in order to resolve such issues promptly.

Respectfully submitted,

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